



Isolate diamondoids from petroleum feedstocks 12 13 Provide diamondoids as Exemplary components for use in Components nanoscale construction rods brackets screws gears 14 15 Assemble two or more Exemplary Subystems components in a nanoscale AFM tip subassembly tachometer & signal wave-form generator clutches racket/pawl FIG. 1 self assembling cellular membrane pore / channel

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TITLE: DIAMONDOID-BASED COMPONENTS IN NANOSCALE CONSTRUCTION
INVENTOR(S): ROBERT M. CARLSON ET AL.
APPLN. NO.: 10/621,718
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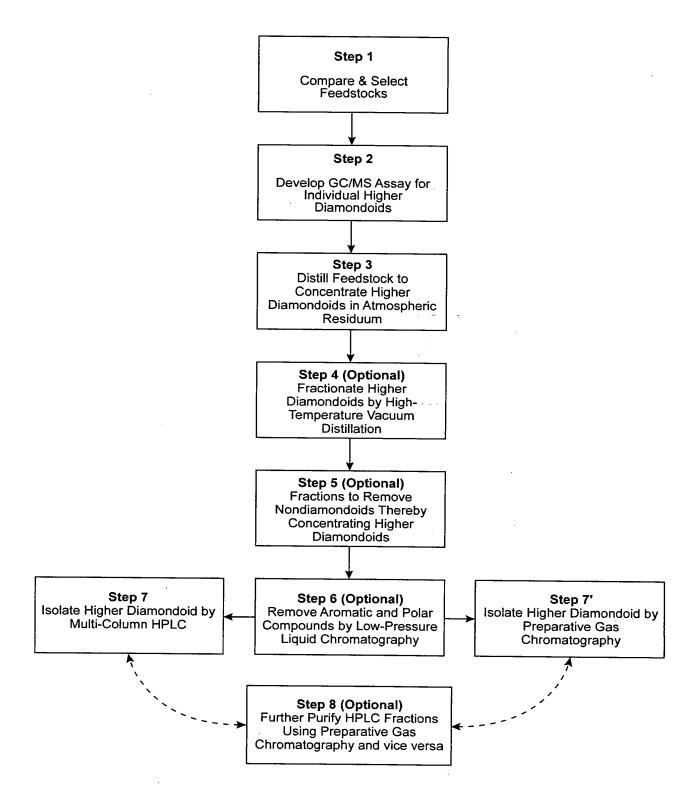


FIG. 2

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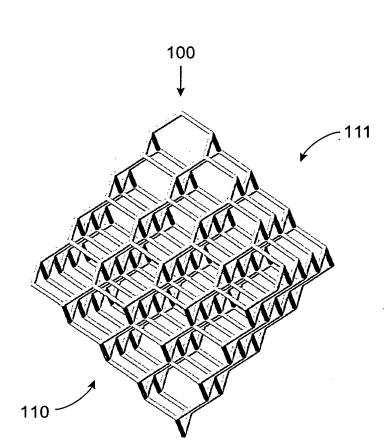
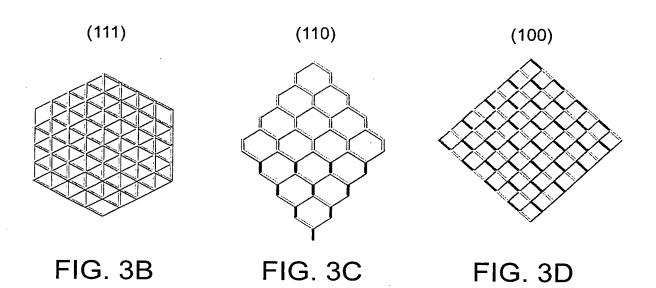


FIG. 3A

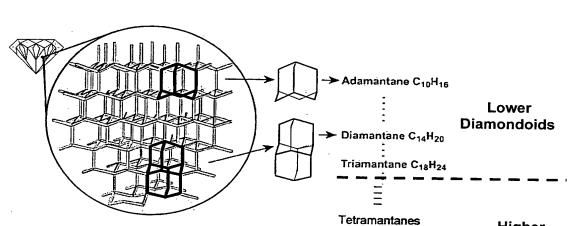


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Diamond Lattice

Higher C₂₂ H₂₈ – 4 structures **Diamondoids**

Pentamantanes $C_{26}H_{32} - 9$ structures $C_{25}H_{30} - 1$ structure Hexamantanes

 $C_{30}H_{36}$ – 28 structures $C_{29}H_{34}$ – 10 structure $C_{26}H_{30}$ – 1 structure

Heptamantanes $C_{34}H_{40} - 85$ structures $C_{33}H_{38} - 67$ structure $C_{32}H_{36} - 6$ structure $C_{30}H_{34} - 2$ structure

Octamantanes

 $C_{38}H_{44}$ C₃₇H₄₂ C₃₆H₄₀ C₃₄H₃₈ C₃₃H₃₆

Nonamantanes Undecamantanes

C₄₂H₄₈ C₄₁H₄₆ C₅₀H₅₆ Decamantanes 1111 C₄₉H₅₄ C₄₀H₄₄ C₃₈H₄₂ $C_{46}H_{52}$ C₄₈H₅₂ C₄₅H₅₀ C₄₄H₄₈ C₃₇H₄₀ C₄₆H₅₀ C₄₂H₄₆ C₃₄H₃₆ C₄₅H₄₈ C41H44 C₄₂H₄₄ C₃₈H₄₀ C₄₁H₄₂ C₃₅H₃₆ C₃₉H₄₀

FIG. 4

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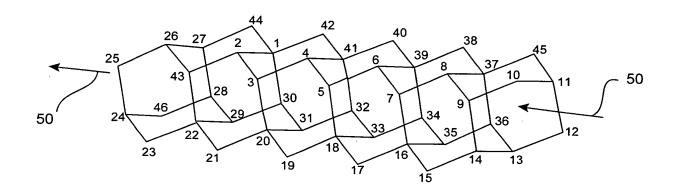


FIG. 5A

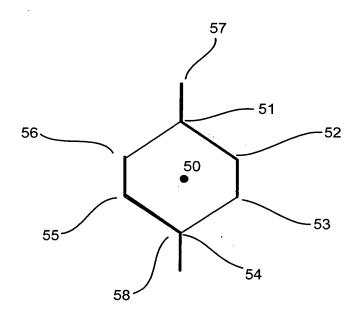


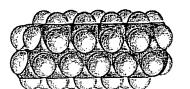
FIG. 5B

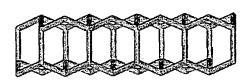
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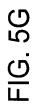
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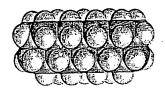
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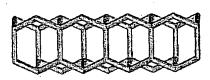
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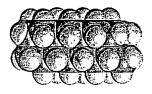


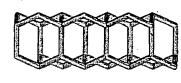




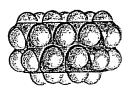


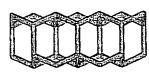




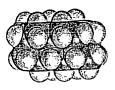


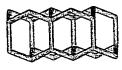












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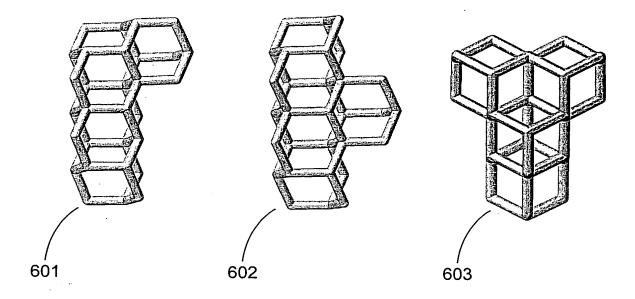
T		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
Number of adamantane	Tetramantane n=4	Petramantane n=5	Hexamantane n=6	Heptamantane n=7
Number Type	n-2=2 all secondary	m-2=3 all secondary	n-3=3 all secondary	m-3=4 all secondary
Number Type	n-2=2 all secondary	m-3=2 all secondary	n-3=3 all secondary	m-4=3 all secondary
Number Type	n-1=3 2 tertiary carbons at the ends 1 quaternary carbon in the middle	m-1=4 2 tertiary carbons at the ends 2 quaternary carbons in the middle	n-2=4 2 tertiary carbons at the ends 2 quaternary carbons in the middle	m-2=5 2 tertiary carbons at the ends 2 quaternary carbons in the middle
Number Type	n-1=3 2 tertiary carbons at the ends 1 quaternary carbon in the middle	m-2=3 2 tertiary carbons at the ends 1 quaternary carbon in the middle	n-2=4 2 tertiary carbons at the ends 2 quaternary carbons in the middle	m-2=5 2 tertiary carbons at the ends 2 quaternary carbons in the middle
Number Type	n-1=3 1 secondary,1 tertiary carbon at the ends 1 tertiary carbon in the middle	m-1=4 2 secondary carbons at the ends 2 tertiary carbons in the middle	n-2=4 1 secondary,1 tertiary carbon at the ends 2 tertiary carbons in the middle	m-2=5 2 secondary carbons at the ends 3 tertiary carbons in the middle
Number Type	n-1=3 1 secondary,1 tertiary carbon at the ends 1 tertiary carbon in the middle	m-2=3 2 tertiary carbons at the ends 1 tertiary carbon in the middle	n-2=4 1 secondary,1 tertiary carbon at the ends 2 tertiary carbons in the middle	m-3=4 2 tertiary carbons at the ends 2 tertiary carbons in the middle
	Number Type Number Type Number Type Number Type Number Type Number Type	Number of adamantane Number Type Number n-2=2 all secondary Number n-1=3 Type Number n-1=3 2 tertiary carbons at the ends 1 quaternary carbon in the middle Number Type Number n-1=3 2 tertiary carbons at the ends 1 quaternary carbon in the middle Number n-1=3 1 secondary,1 tertiary carbon at the ends 1 tertiary carbon in the middle Number n-1=3 1 secondary,1 tertiary carbon in the middle Number n-1=3 1 tertiary carbon at the ends 1 tertiary carbon	Number of adamantane Number Type Number Ty	Number Type

FIG. 5H

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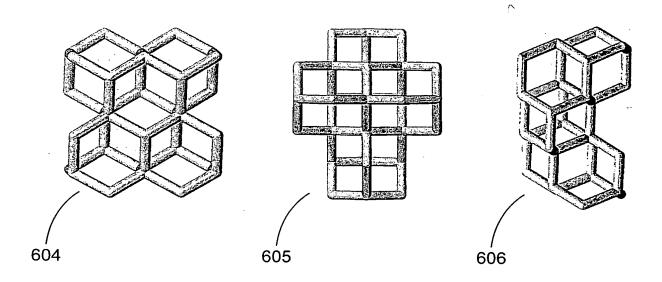
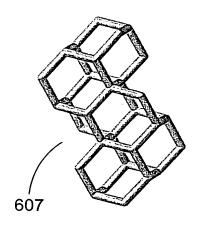


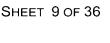
FIG. 6A



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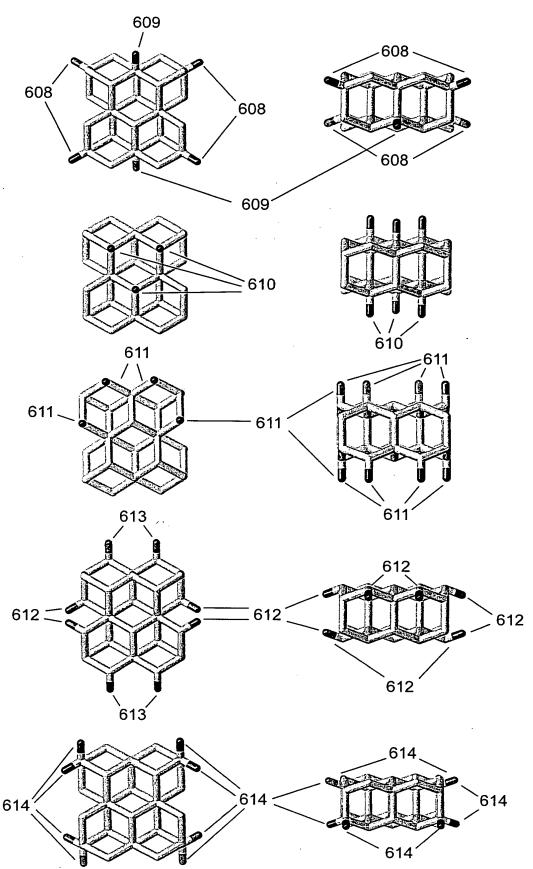


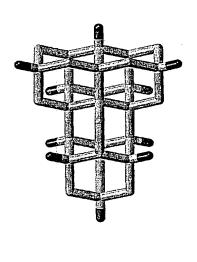
FIG. 6B

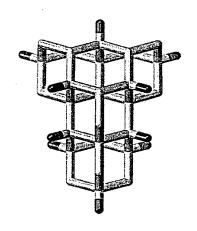
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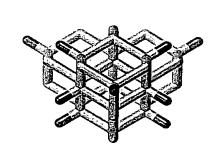
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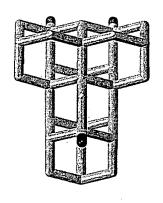
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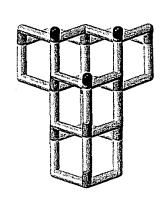
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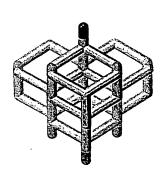


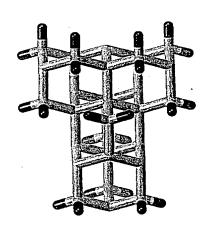


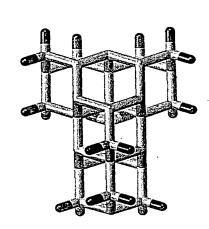












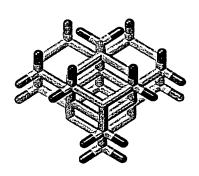


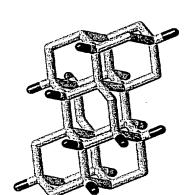
FIG. 6C

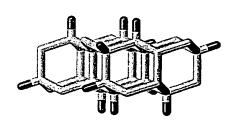
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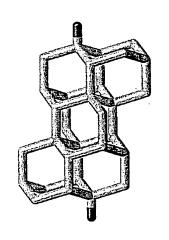
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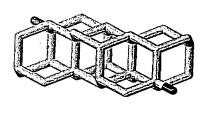
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INVENTOR(S): ROBERT M. CARLSON ET AL.
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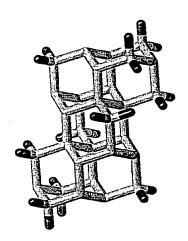
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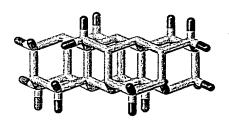


FIG. 6D

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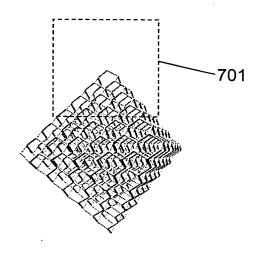


FIG. 7A

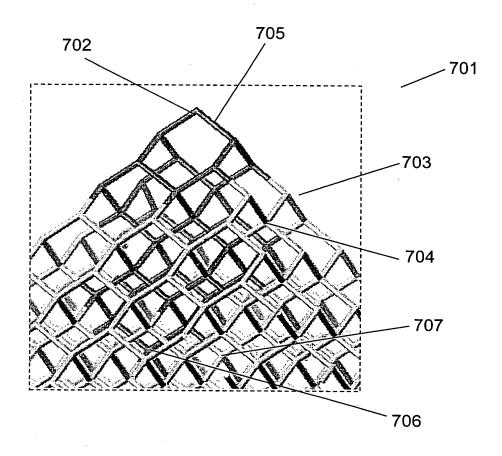


FIG. 7B

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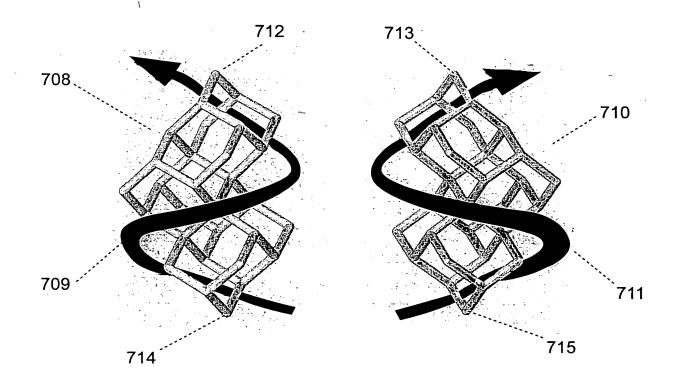


FIG. 7C

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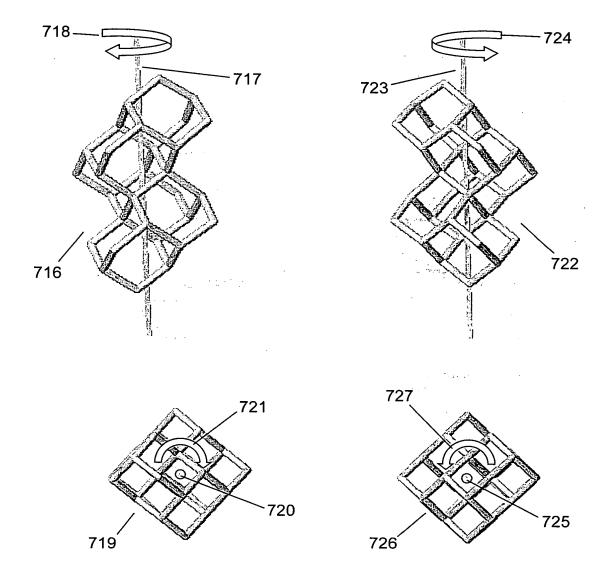


FIG. 7D

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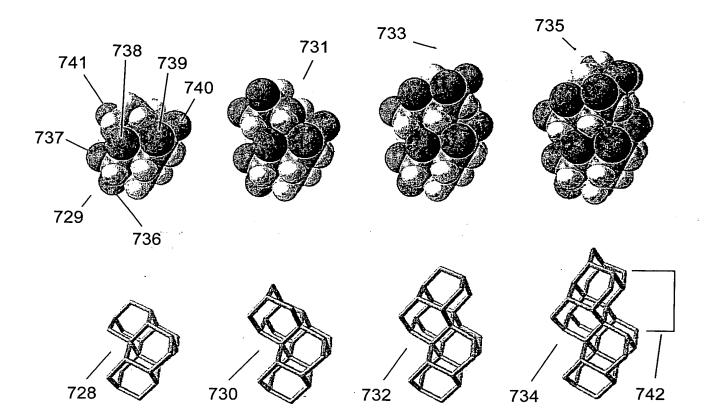


FIG. 7E

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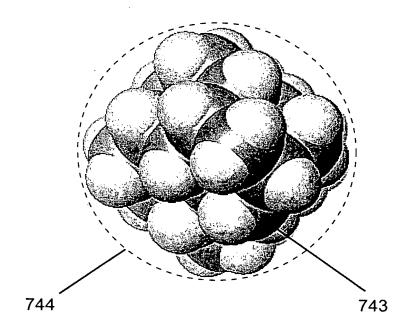
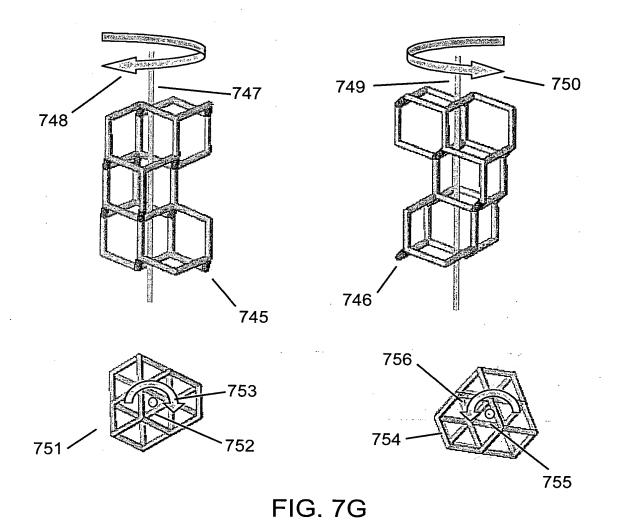


FIG. 7F

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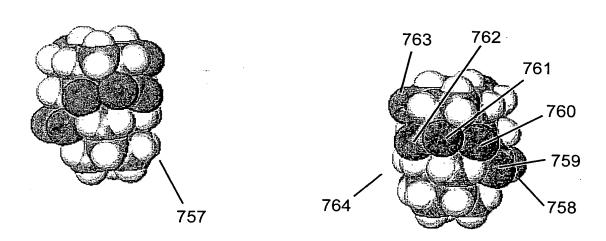


FIG. 7H

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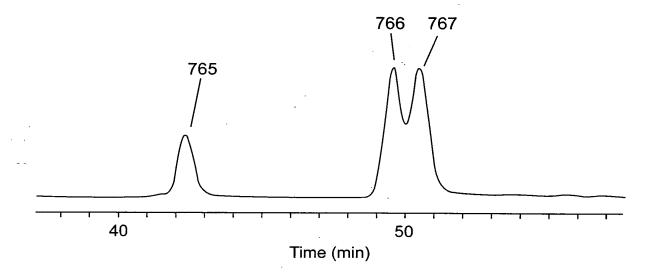


FIG. 71

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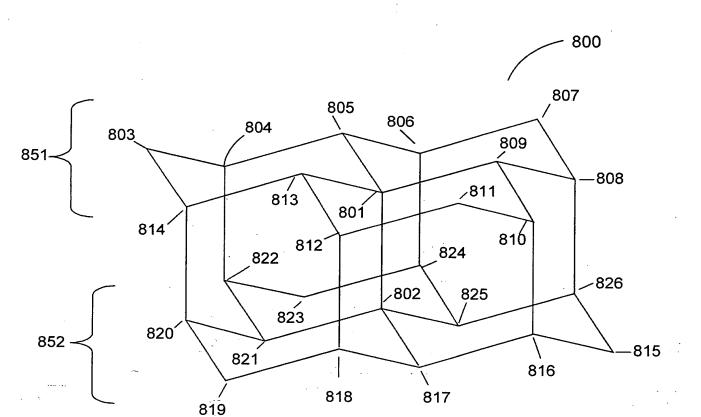


FIG. 8A

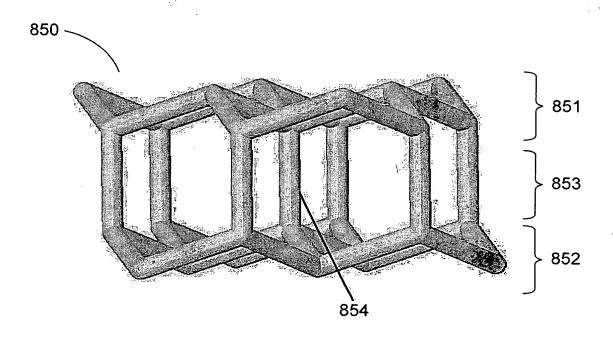


FIG. 8B

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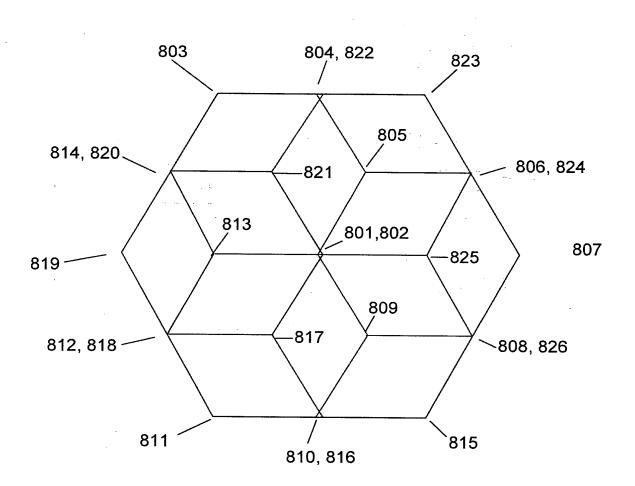


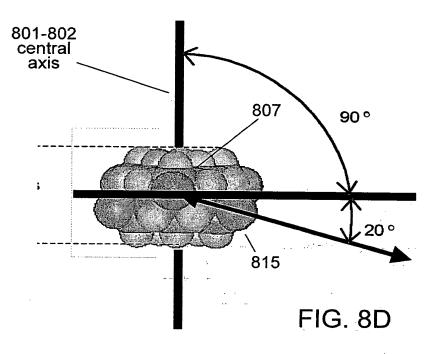
FIG. 8C

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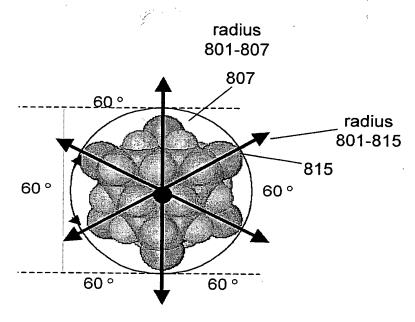


FIG. 8E

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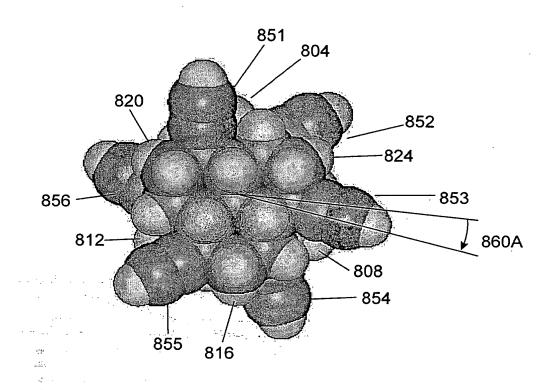


FIG. 8F

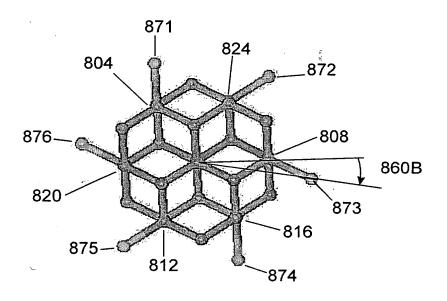


FIG. 8G

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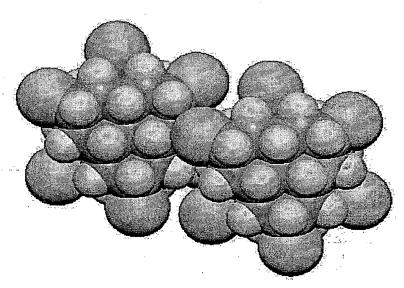


FIG. 8H

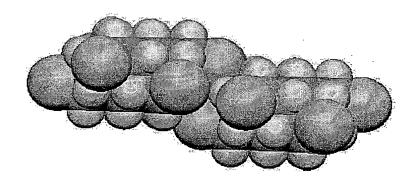


FIG. 81

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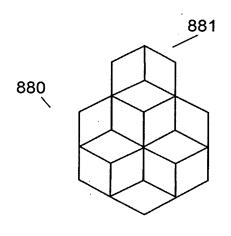
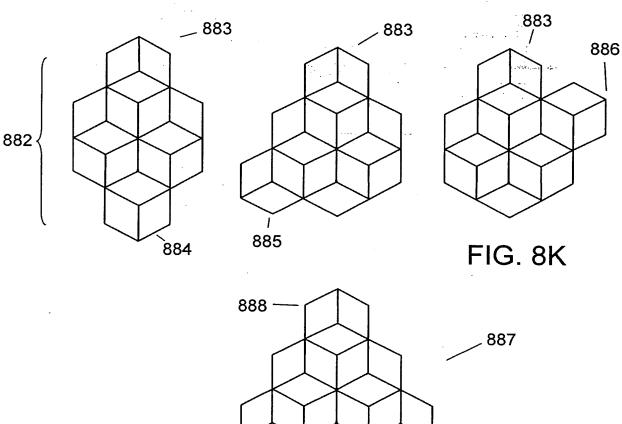


FIG. 8J



890

FIG. 8L

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APPLN. FILING DATE: JULY 16, 2003

TITLE: DIAMONDOID-BASED COMPONENTS IN
NANOSCALE CONSTRUCTION
INVENTOR(S): ROBERT M. CARLSON ET AL.
APPLN. NO.: 10/621,718

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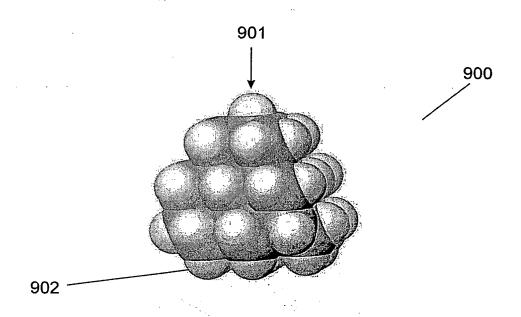


FIG. 9A

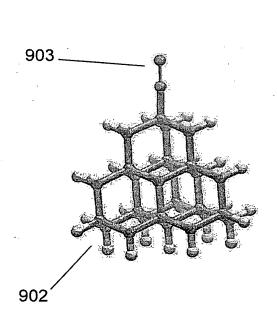


FIG. 9B

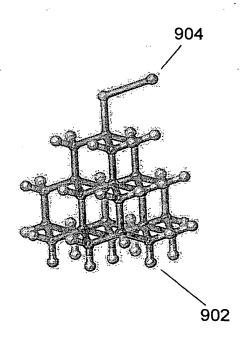


FIG. 9C

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APPLN. FILING DATE: JULY 16, 20G3

TITLE: DIAMONDOID-BASED COMPONENTS IN
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INVENTOR(S): ROBERT M. CARLSON ET AL.
APPLN. NO.: 10/621,718

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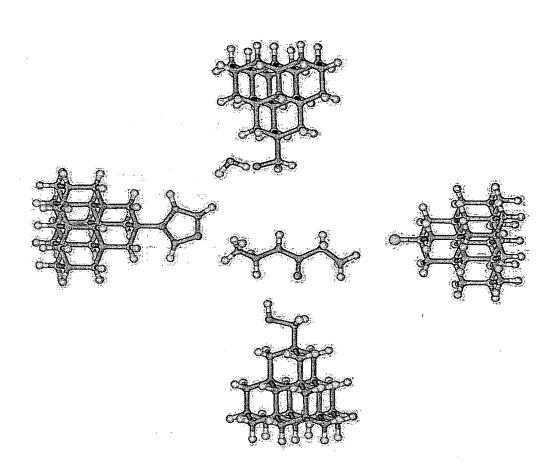
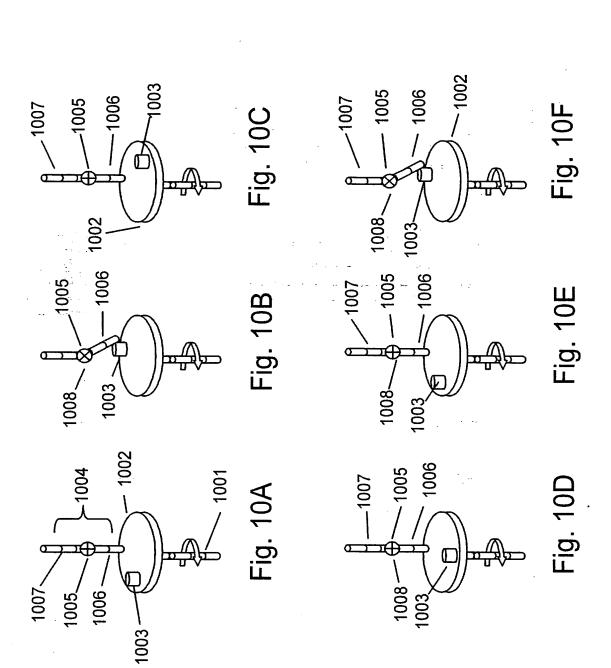


FIG. 9D

REPLACEMENT SHEET

APPLN. FILING DATE: JULY 16, 2003 ,

TITLE: DIAMONDOID-BASED COMPONENTS IN
NANOSCALE CONSTRUCTION
INVENTOR(S): ROBERT M. CARLSON ET AL.
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REPLACEMENT SHEET

APPLN. FILING DATE: JULY 16, 2003*

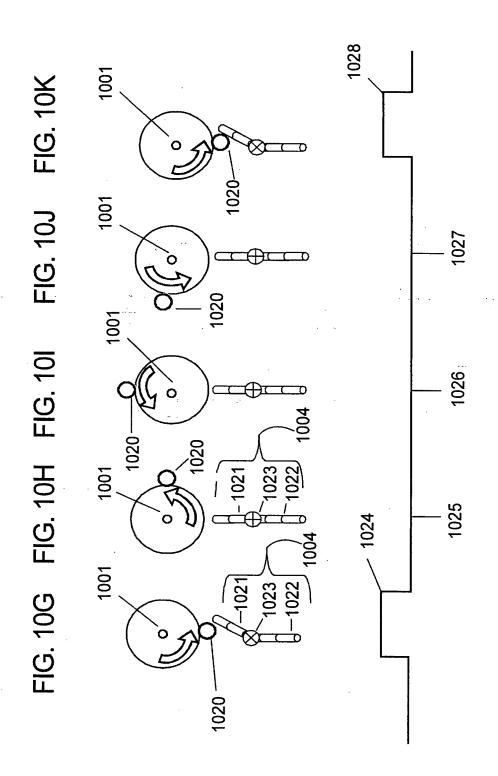
TITLE: DIAMONDOID-BASED COMPONENTS IN

NANOSCALE CONSTRUCTION

INVENTOR(S): ROBERT M. CARLSON ET AL.

APPLN. No.: 10/621,718

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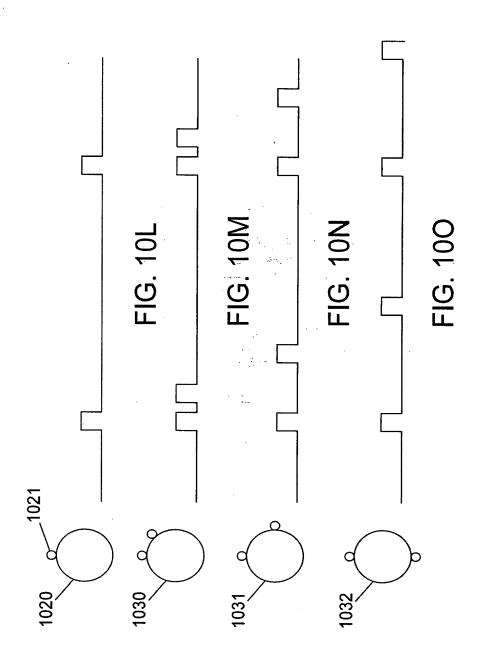


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TITLE: DIAMONDOID-BASED COMPONENTS IN
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INVENTOR(S): ROBERT M. CARLSON ET AL.
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NANOSCALE CONSTRUCTION
INVENTOR(S): ROBERT M. CARLSON ET AL.
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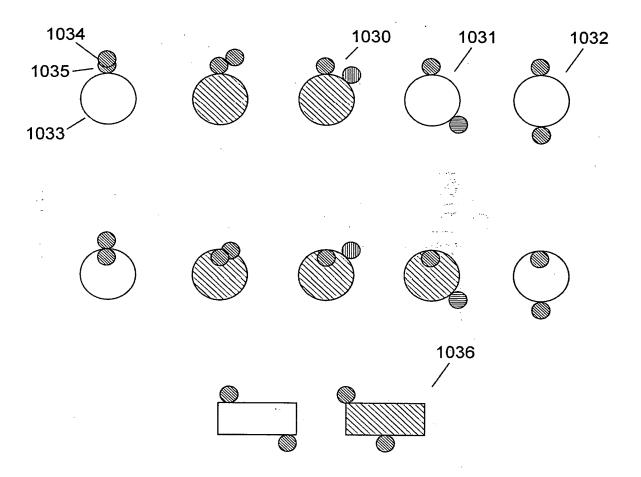


FIG. 10P

REPLACEMENT SHEET

APPLN. FILING DATE: JULY 16, 2003

TITLE: DIAMONDOID-BASED COMPONENTS IN
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INVENTOR(S): ROBERT M. CARLSON ET AL.
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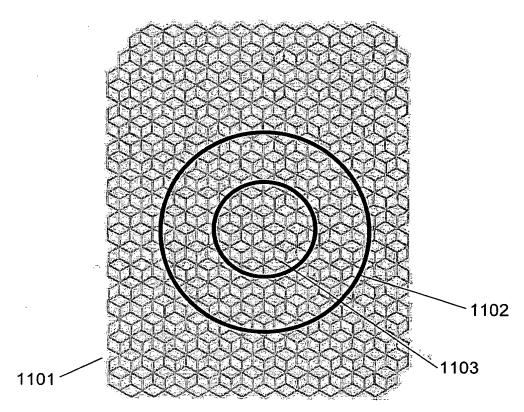


FIG. 11A

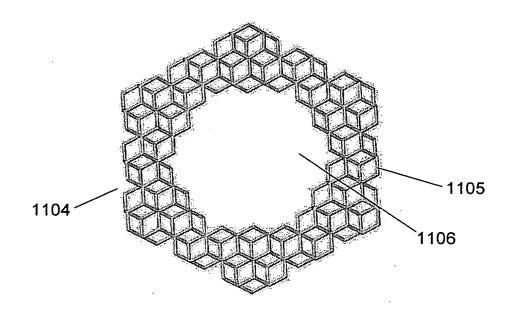


FIG. 11B

REPLACEMENT SHEET

APPLN. FILING DATE: JULY 16, 2003

TITLE: DIAMONDOID-BASED COMPONENTS IN
NANOSCALE CONSTRUCTION
INVENTOR(S): ROBERT M. CARLSON ET AL.
APPLN. NO.: 10/621,718

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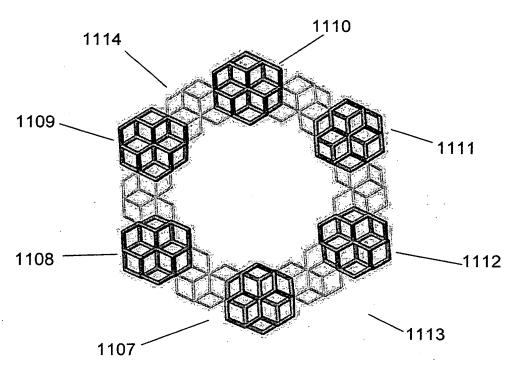


FIG. 11C

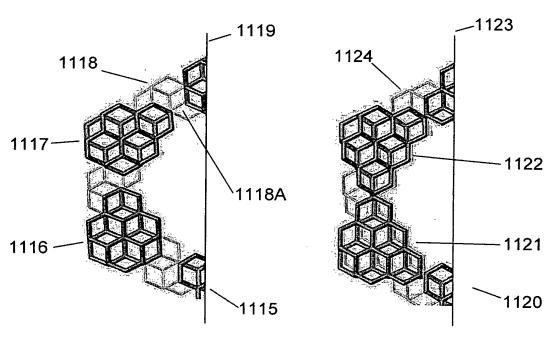


FIG. 11D

FIG. 11E

REPLACEMENT SHEET

APPLN. FILING DATE: JULY 16, 2003*

TITLE: DIAMONDOID-BASED COMPONENTS IN

NANOSCALE CONSTRUCTION

INVENTOR(S): ROBERT M. CARLSON ET AL.

APPLN. No.: 10/621,718

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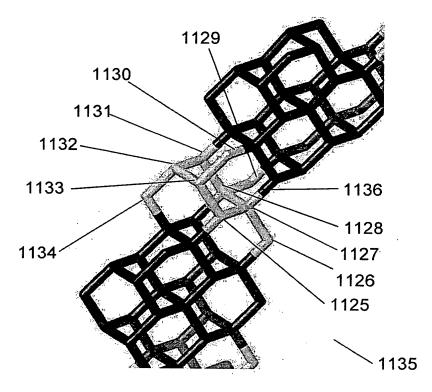


FIG. 11F

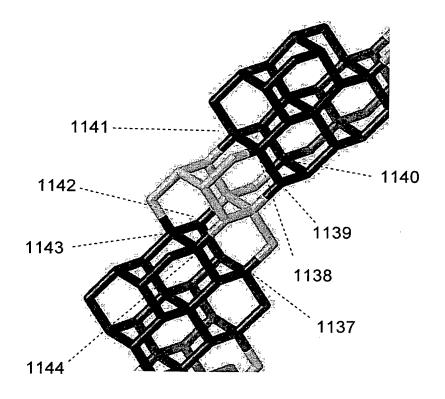


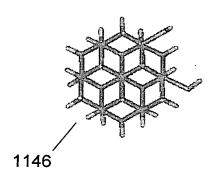
FIG. 11G

REPLACEMENT SHEET

APPLN. FILING DATE: JULY 16, 2003

TITLE: DIAMONDOID-BASED COMPONENTS IN
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INVENTOR(S): ROBERT M. CARLSON ET AL.
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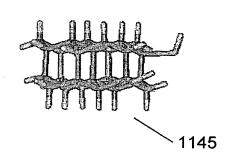
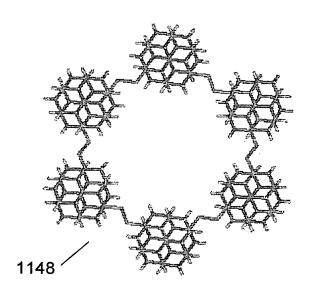


FIG. 11H



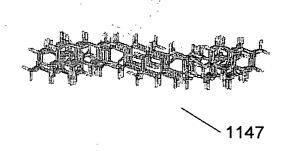
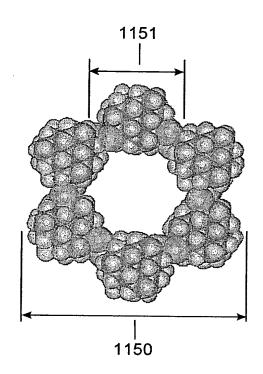


FIG. 111





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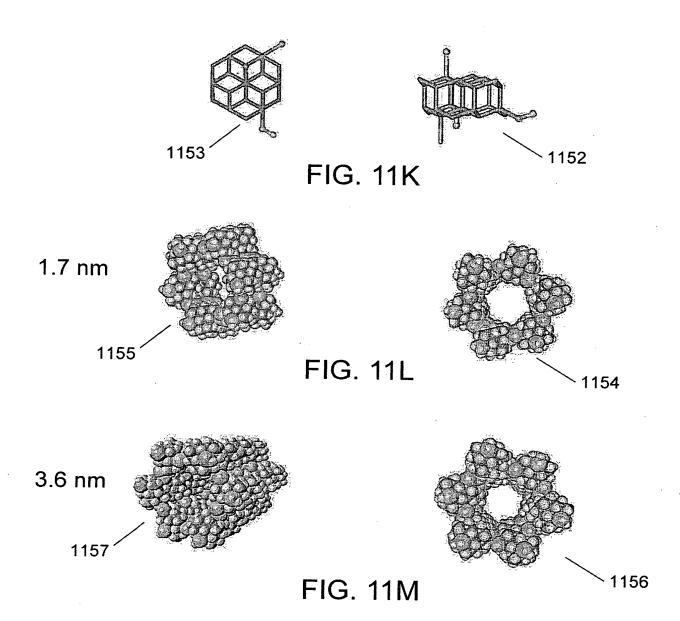
FIG. 11J

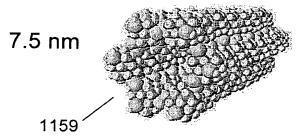
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TITLE: DIAMONDOID-BASED COMPONENTS IN
NANOSCALE CONSTRUCTION
INVENTOR(S): ROBERT M. CARLSON ET AL.
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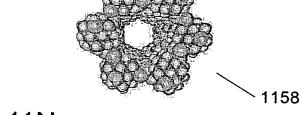


FIG. 11N

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APPLN. FILING DATE: JULY'16, 2003

TITLE: DIAMONDOID-BASED COMPONENTS IN
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INVENTOR(S): ROBERT M. CARLSON ET AL.
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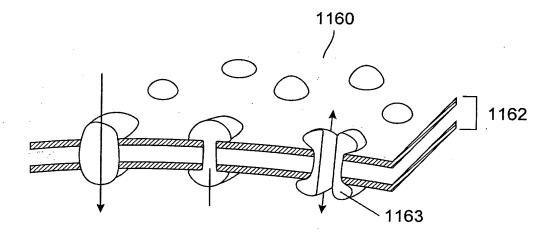


FIG. 110